

E42 p48se SPB

2001-07-05

CLAIMS

- 5 1. An oscillator circuit comprising a first differential oscillator and a second differential oscillator, the first differential oscillator comprising at least one fundamental frequency AC-ground point, the second differential oscillator comprising at least one fundamental frequency AC-ground, the first differential oscillator and the second differential oscillator having substantially
- 10 the same fundamental frequencies, **characterized in that** the oscillator circuit comprises a first AC coupling between one of the at least one fundamental frequency AC-ground points of the first differential oscillator and one of the at least one fundamental frequency AC-ground points of the second differential oscillator, thus locking the first differential oscillator to the
- 15 second differential oscillator.
2. The oscillator circuit according to claim 1, **characterized in that** the oscillator circuit comprises a first quadruple frequency output, the first quadruple frequency output being coupled to the first AC coupling.
- 20 3. The oscillator circuit according to claim 1 or 2, **characterized in that** the first differential oscillator and the second differential oscillator are substantially identical.
- 25 4. The oscillator circuit according to claim 3, **characterized in that** the first AC coupling is between a first fundamental frequency AC-ground point of the first differential oscillator and a first fundamental frequency AC-ground point of the second differential oscillator, the first fundamental frequency AC-ground points being identical fundamental frequency AC-ground points.

30

5. The oscillator circuit according to claim 4, **characterized in that** the oscillator circuit comprises four fundamental frequency outputs, the four outputs being in quadrature.

5 6. The oscillator circuit according to claim 4 or 5, **characterized in that** the oscillator circuit comprises a second AC coupling between a second fundamental frequency AC-ground point of the first differential oscillator and a second fundamental frequency AC-ground point of the second differential oscillator, the second fundamental frequency AC-ground points being
10 identical fundamental frequency AC-ground points.

7. The oscillator circuit according to claim 6, **characterized in that** the oscillator circuit comprises a second quadruple frequency output, the second quadruple frequency output being coupled to the second AC coupling, the
15 first and second quadruple frequency outputs being differential.

8. The oscillator circuit according to claim 4, **characterized in that** the oscillator circuit comprises a third differential oscillator having at least a first fundamental frequency AC-ground point.
20

9. The oscillator circuit according to claim 8, **characterized in that** the first AC coupling is further AC coupled to the first fundamental frequency AC-ground point of the third differential oscillator.

25 10. The oscillator circuit according to claim 8, **characterized in that** the oscillator circuit comprises a second AC coupling between a second fundamental frequency AC-ground point of the first differential oscillator and a second fundamental frequency AC-ground point of the third differential oscillator, the second fundamental frequency AC-ground points being
30 identical fundamental frequency AC-ground points and separate from the first fundamental frequency AC-ground points.

11. The oscillator circuit according to any one of claims 8 to 10, **characterized in that** the third differential oscillator has substantially a same fundamental frequency as the first and second differential oscillators.

5 12. The oscillator circuit according to any one of claims 8 to 10, **characterized in that** the third differential oscillator has a fundamental frequency which is substantially twice the frequency as the fundamental frequencies of the first and second differential oscillators.

10 13. The oscillator circuit according to any one of claims 8 to 12, **characterized in that** the oscillator circuit comprises a fourth differential oscillator having at least a first fundamental frequency AC-ground point.

14. The oscillator circuit according to claim 13, **characterized in that** the
15 first AC coupling is further AC coupled to the first fundamental frequency AC-ground point of the fourth differential oscillator.

15. The oscillator circuit according to claim 13, **characterized in that** the
oscillator circuit further comprises a third AC coupling between a fundamental
20 frequency AC-ground point of the second differential oscillator being separate from the first fundamental frequency AC-ground point and a corresponding fundamental frequency AC-ground point of the fourth differential oscillator.

16. The oscillator circuit according to any one of claims 13 to 15,
25 **characterized in that** the fourth differential oscillator having a fundamental frequency which is substantially the frequency of the fundamental frequency of the first and second differential oscillator.

17. The oscillator circuit according to any one of claims 13 to 15,
30 **characterized in that** the fourth differential oscillator having a fundamental frequency which is substantially twice the frequency of the fundamental frequency of the first and the second differential oscillator.

18. The oscillator circuit according to any one of claims 13 to 15,
characterized in that the fourth differential oscillator having a fundamental
frequency which is substantially twice the frequency of the fundamental
5 frequency of the third differential oscillator.

19. The oscillator circuit according to any one of claims 1 to 18,
characterized in that one AC coupling between two fundamental frequency
AC-ground points, is further coupled to a voltage source via an AC-
10 impedance element.

20. The oscillator circuit according to any one of claims 1 to 18,
characterized in that one AC coupling between two fundamental frequency
AC-ground points, is further coupled to ground via an AC-impedance
15 element.

21. The oscillator circuit according to any one of claims 1 to 20,
characterized in that one AC coupling between two fundamental frequency
AC-ground points is a direct coupling.
20

22. The oscillator circuit according to any one of claims 1 to 20,
characterized in that one AC coupling between two fundamental frequency
AC-ground points is a resistive coupling.

23. The oscillator circuit according to any one of claims 1 to 20,
characterized in that one AC coupling between two fundamental frequency
AC-ground points is a capacitive coupling.
25

24. An oscillator circuit comprising at least two differential oscillators, the
30 differential oscillators comprising at least one fundamental frequency AC-
ground point each, **characterized in that** the oscillator circuit comprises at
least one AC coupling between one of the at least one fundamental

frequency AC-ground points of one of the differential oscillators and one of the at least one fundamental frequency AC-ground points of another one of the differential oscillators.

- 5 25. A communication unit, **characterized in that** the communication unit comprises an oscillator circuit according to any one of claims 1 to 24.
26. A method of frequency locking a first differential oscillator to a second differential oscillator, **characterized in that** the method comprises AC
- 10 coupling a fundamental frequency AC-ground of the first differential oscillator with a fundamental frequency AC-ground of the second differential oscillator.